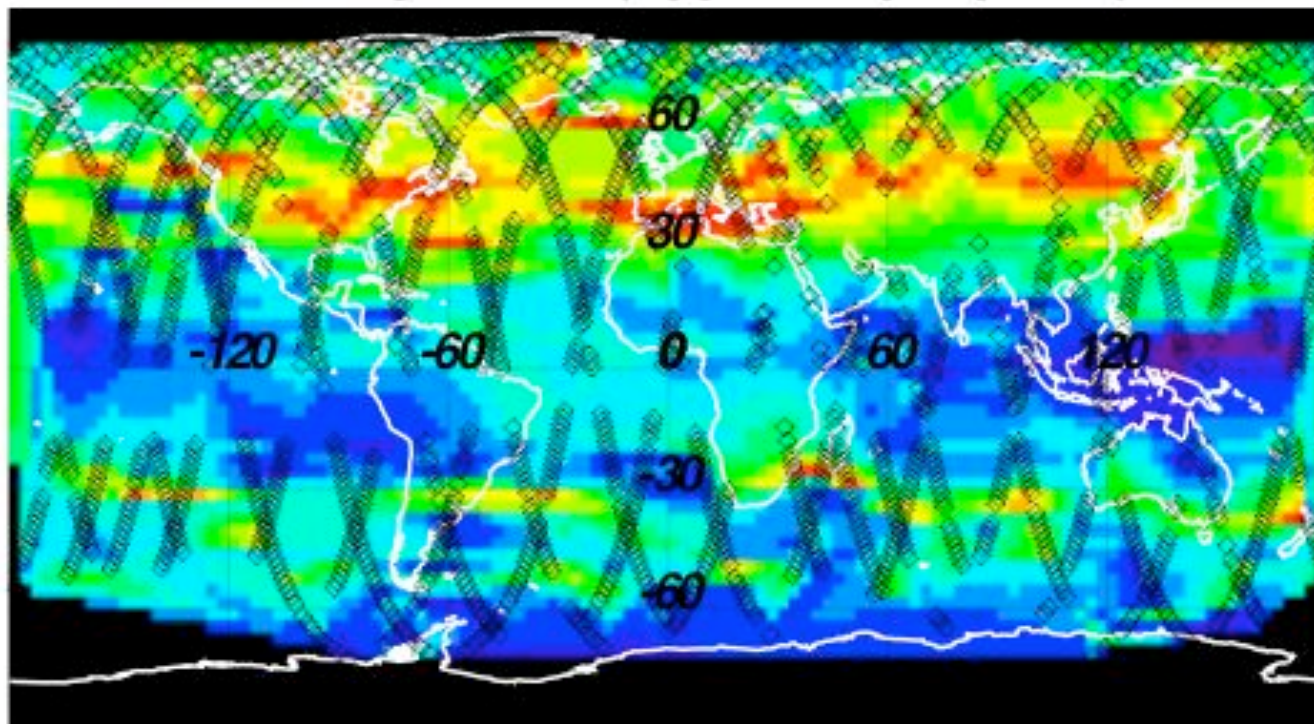


# SATELLITE VALIDATION APPROACH IN INTEX-B

Integration of aircraft and satellite observations is key to a successful mission!

Concurrent observations of ozone and CO from TES track long-range transport of Asian and Mexican plumes

*TES July 7 2005 (Upper Troposphere)*



## **Mark Schoeberl: “What we are looking for from INTEX” (Aura validation)**

- **Stratosphere and UT/LS O<sub>3</sub> and T for HIRDLS**
  - **INTEX flights should include night measurements along HIRDLS track (will also help MLS & TES)**
- **Tropospheric measurements for MLS, OMI & TES**
  - **Specific sub-satellite spirals (CO, T, H<sub>2</sub>O, HNO<sub>3</sub>, O<sub>3</sub>, NO<sub>2</sub>)**
- **Improved sonde coincidences (AVDC web tool + more active management)**
  - **HIRDLS and TES have a priority - look at who is closest to sonde site at overpass time - may be an hour apart.**

- **Stratosphere and UT/LS O<sub>3</sub> and T for HIRDLS**

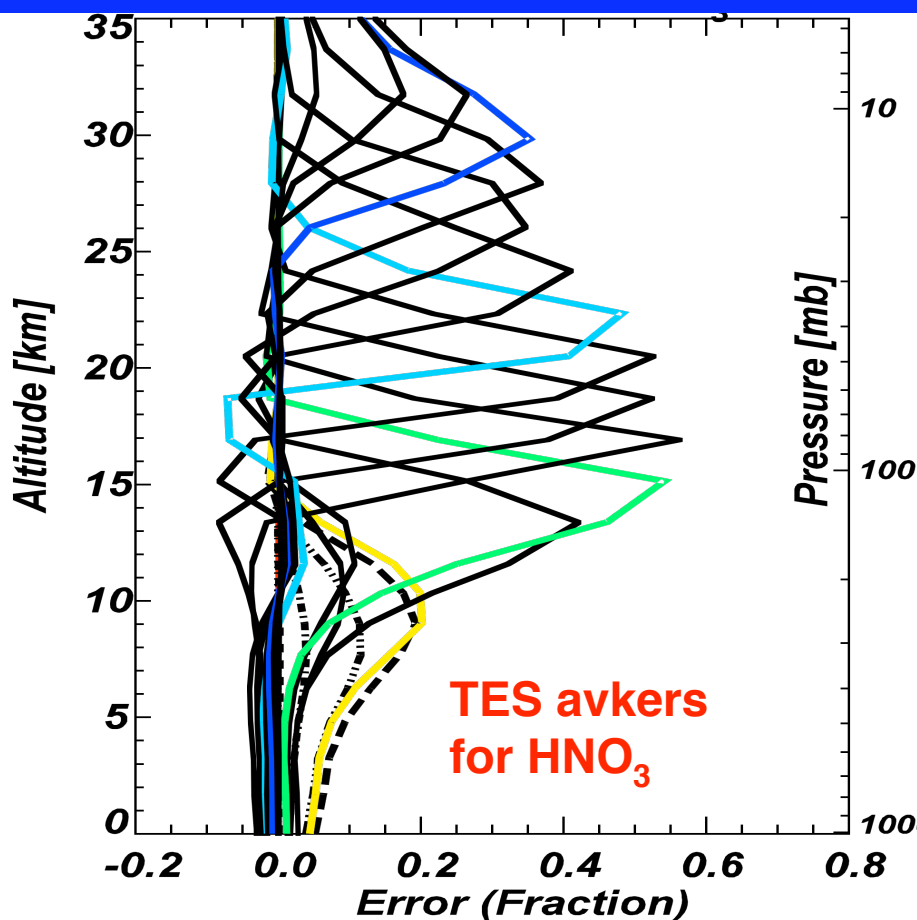
- **INTEX flights should include night measurements along HIRDLS track (will also help MLS & TES)**

- **INTEX-B will conduct two nighttime ferries in upper troposphere along Aura track stretching for over 20° latitude**
- **Vertical profiling can be done on these ferries as long as there are no clouds overhead**
- **These ferries will be on preset schedule - combine with TES special obs focusing on limb viewing**
- **Consider Grand Forks – Houston transits: (1) low scientific stake, (2) early in mission to ensure that data meets validation needs**
- **Also take opportunity to validate CALIPSO using DIAL**
- **Need information on HIRDLS, MLS, TES, CALIPSO viewing tracks**
- **In situ validation of limb ozone, CO, H<sub>2</sub>O, HNO<sub>3</sub>, HCN**

- Tropospheric measurements for MLS, OMI & TES

- Specific sub-satellite spirals (CO, T, H<sub>2</sub>O, HNO<sub>3</sub>, O<sub>3</sub>, NO<sub>2</sub>)

- Collocation with TES greatest challenge because of limited coverage; wish special observation mode of continuous nadir (CO, T, H<sub>2</sub>O, O<sub>3</sub>) followed by limb back-viewing (HNO<sub>3</sub>). Need identification of TES viewing scenes along Aura orbit tracks



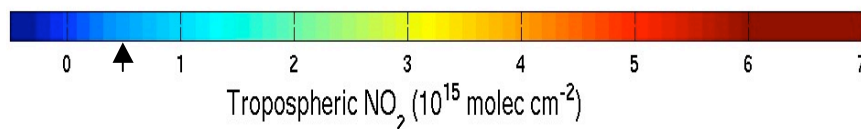
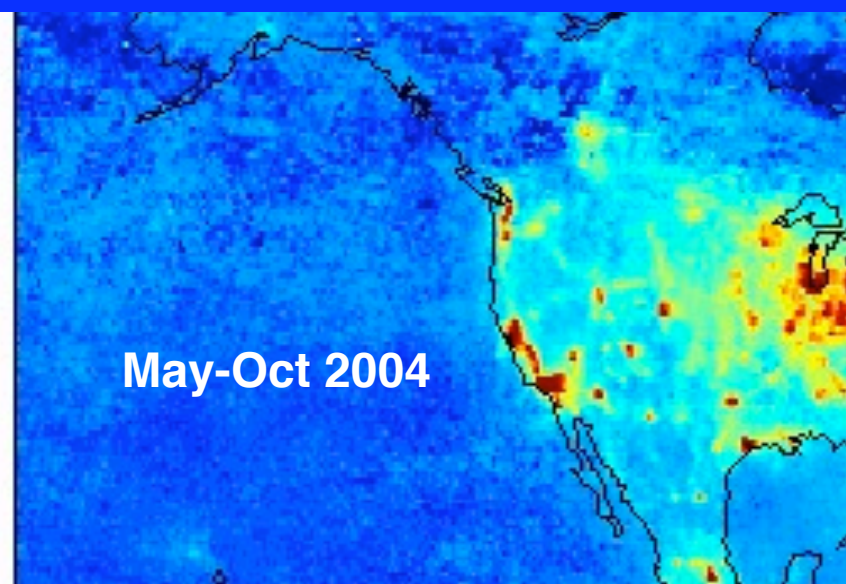
- DC-8 ceiling may be limitation for TES HNO<sub>3</sub> direct validation
  - ...but HIRDLS, MLS, models will provide supplementary information

- Expect 6-10 validation spirals over ocean and land, seek mix of polluted and clean; OMI wants clear-sky conditions, TES wants a mix of clear and cloudy.

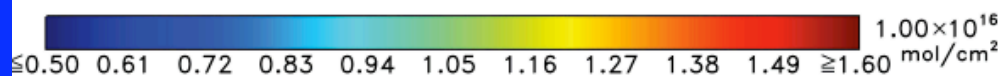
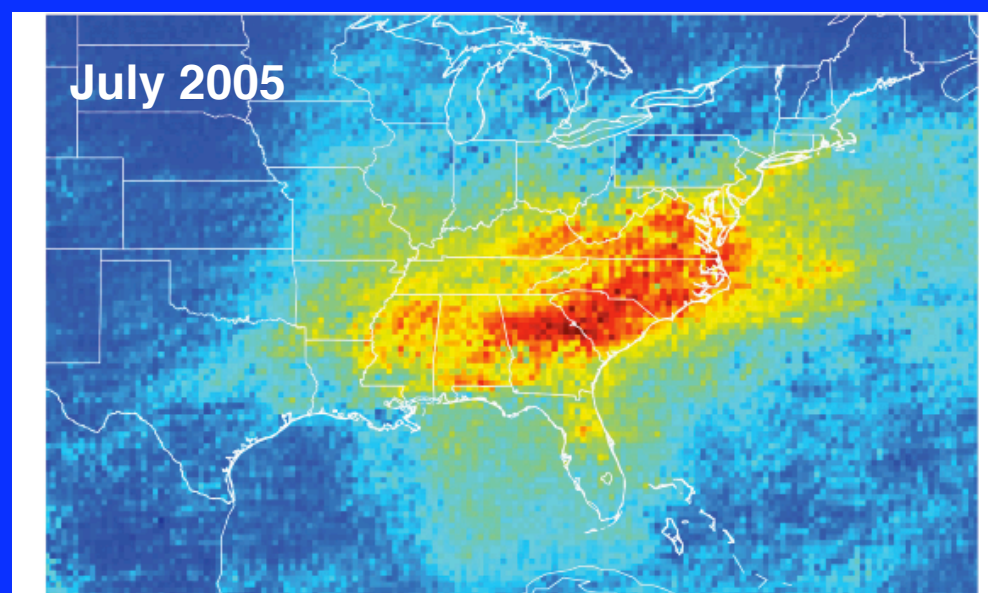
## •Tropospheric measurements for MLS, OMI & TES (cont.)

- Specific sub-satellite spirals (CO, T, H<sub>2</sub>O, HNO<sub>3</sub>, O<sub>3</sub>, NO<sub>2</sub>)also HCHO, SO<sub>2</sub>
- OMI NO<sub>2</sub> and HCHO validation must focus on continental and near-shore scenes in source regions
  - Spirals in Houston and Seattle areas, over SE U.S., and over Mexico
  - Important role for C-130 operating out of Seattle

SCIA NO<sub>2</sub> (R. Martin)



OMI HCHO (T. Kurosu and K. Chance)



# VALIDATION OF OTHER SATELLITE SENSORS

Previous validation  $\Rightarrow$  much less priority and commitment than for Aura; but some validation will be important for integration with the aircraft observations

- We plan to devote some resources to validate:
  - MOPITT CO, AIRS CO & CO<sub>2</sub>
  - MODIS and MISR AOD
  - SCIAMACHY NO<sub>2</sub>, CO (over land)